

substance (X) from a solid material or semi-solid material, etc. ( $M^1X$ ) by means of electrolysis in a  $M^2Y$  bath, see page 4, line 26.

In this method, for the case wherein  $M^1$ ,  $M^2$ , X, and Y correspond to Ti, Ca, O, and Cl, respectively, the following is exemplified:

a white  $TiO_2$  pellet was placed in molten  $CaCl_2$  at 950 °C, and after a potential of 3 V was applied and held for 5 hours, the pellet turns to titanium of 99.8% purity, see page 9, lines 5-10, Example 1;

a titanium foil with a thick coating of oxide was placed in molten  $CaCl_2$  at 950 °C, and after a potential of 1.75 V was applied and held for 1.5 hours, the oxide layer had been completely reduced to metal, see page 9, line 11-15, Example 2.

Using Example 1, the Examiner takes the position that the titanium oxide being reduced in the  $CaCl_2$  bath of Fray I functions to purify the salt bath and therefore the steps of claim 1 are taught. However, a close review of Example 1 reveals no mention in Fray I that the bath is purified. Instead, Fray I teaches that oxygen contained in the titanium oxide is removed by virtue of the salt bath. Therefore, Fray I cannot be said to teach a method of purifying a metal salt which comprises bringing the metal salt into contact with one or more of titanium, titanium alloy, zirconium and zirconium alloy for the purpose of adsorbing impurities in the metal salt. Since Fray I does not teach this method, it cannot be said to anticipate claim 1.

Applicant notes that the Examiner equates the claimed titanium alloy with the titanium oxide so as to be able to support the anticipation rejection. This is another

error on the Examiner's part since titanium oxide would never be considered a titanium alloy.

While it is true that Fray I teaches the presence of titanium oxide in a melt of  $\text{CaCl}_2$ , this is not the same as the claimed method of adsorbing impurities in the metal salt via the use of titanium, a titanium alloy, zirconium, and a zirconium alloy.

Moreover, the role of titanium oxide in Fray I is not the same as the role of the titanium alloy of claim 1. As described above, in Fray I, titanium oxide is the material being reduced to titanium using the molten metal salt bath. In the invention, the titanium alloy is used to purify the molten bath. The process of the invention and Fray I are not in the least similar, let alone the same, and Fray I cannot be considered to be an anticipatory reference.

It is also flawed for the Examiner to consider the titanium oxide to function as the titanium alloy of claim 1 so that the Examiner can say that the adsorbing impurities in the bath inherently occurs. While the Examiner can give titanium oxide any name the Examiner may want, the question is not what titanium oxide may be called but whether the placement of the titanium oxide pellet or a titanium oxide-coated foil in a bath of  $\text{CaCl}_2$  for the purpose of deoxidation can be considered to be the same method as the method of claim 1. This approach is improper since there is no basis to conclude that placing titanium oxide in a metal bath adsorbs impurities as is required by claim 1. The Examiner is called upon to substantiate with some objective evidence that the function defined by claim 1 inherently occurs in the reducing method of Fray I.

The rejection is also flawed notwithstanding the reliance on Fray II when rejecting claim 4. Claim 4 is directed to a method of deoxidizing a titanium material by dissolving metallic calcium in a bath purified according to the method of claim 1. Admitting that the Fray I method cannot be used as both the purifying method of claim 1 and the deoxidizing method of claim 4, the Examiner is required to cited Fray II, which also discloses a titanium oxide reducing process. In fact, Fray I is cited as prior art in Fray II, and Fray II is an improvement over Fray I, see paragraphs [0020-0023] of the US published Fray II.

What Fray II teaches is the combination of the method of Fray I, which is an electro-deoxidation method, with a reactive metal deoxidation technique developed by Fray II. This combination still is not the same as the combined processing of claim 4, which is the purification of the metal bath (claim 1), and the deoxidation process involving metal calcium (claim 4).

Therefore, the reliance of Fray II does not cure the deficiency in the teachings of Fray I and the rejection of claims 1 and 4 is improper and must be withdrawn.

The rejection of claim 7 is also improper. Claim 7 defines a two step process of electrolysis using a bath purified by the method of claim 1. In the rejection, the Examiner cites Example 1 as the basis for concluding that the electrolysis method of claim 7 is taught. The problem with this approach is that the Examiner cites the very same electrolysis processing to say that the purifying method of claim 1 is taught. Claim 7 cites a method whereby electrolysis is conducted using a molten product of a metal salt purified by the method of claim 1. By citing the same process of Fray I for

purification and deoxidation, the Examiner's reasoning means that purification must occur at the same time as the electrolysis. However, claim 7 requires that the electrolysis be conducted in a bath that has been purified. This sequence of events cannot occur with the Examiner's reasoning since the same process is cited for both of the steps required in claim 7. This inconsistency further reveals the flaw in the rejection, i.e., the electrolysis deoxidation of Fray I is the same as the metal bath purifying of claim 1.

In summary, neither Fray I nor Fray II teaches or suggests the purifying method of claim 1. The Examiner is speculating regarding the teachings of the prior art, particularly with respect to the electrolysis deoxidation process of Fray I, and this speculation cannot take the place of the required objective evidence to support both a rejection based on 35 U.S.C. § 102(b) and/or 35 U.S.C. § 103(a). Lacking any teaching regarding the purifying process of claim 1, the Examiner has no choice but to withdraw the rejection as applied to claims 1, 7, and the remaining dependent claims.

Accordingly, the Examiner is requested to examine this application in light of this response and pass all pending claims onto issuance.

If the Examiner believes that an interview would be helpful in expediting the allowance of this application, the Examiner is requested to telephone the undersigned at 202-835-1753.

The above constitutes a complete response to all issues raised in the Office Action dated January 30, 2008.

Again, reconsideration and allowance of this application is respectfully requested.

Applicant respectfully submits that there is no fee required for this submission, however, please charge any fee deficiency or credit any overpayment to Deposit Account No. 50-1088.

Respectfully submitted,  
CLARK & BRODY

A handwritten signature in black ink, appearing to read "Christopher W. Brody", written over a horizontal line.

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Docket No.: 12054-0029  
Date: April 29, 2008